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10/023,267	12/14/2001	Moses Mekala David	56783US002	5498

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EXAMINER	
PADGETT, MARIANNE L	

ART UNIT	PAPER NUMBER
1762	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/023,267	Applicant(s) David et al
	Examiner M.L. Padgett	Group Art Unit 1762

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☒ Responsive to communication(s) filed on 8/18/03 & 5/24/02, 5/16/02, 3/15/02 & 3/1/02.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-22 is/are pending in the application.

Of the above claim(s) 17-22 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-16 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)–(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)–(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☒ Information Disclosure Statement(s), PTO–1449, Paper No(s). 5/16/02 & 5/24/02, 3/15/02, 3/1/02

☐ Interview Summary, PTO–413

☒ Notice of Reference(s) Cited, PTO–892

☐ Notice of Informal Patent Application, PTO–152

☐ Notice of Draftsperson's Patent Drawing Review, PTO–948

☐ Other _____

Office Action Summary

1. Applicant's election with traverse of group I, method claims 1-16 in Paper No. 8/13/03 (mail date) is acknowledged. The traversal is on the ground(s) that the two groups are so interrelated that a search for one group will reveal art for the other, and that even if additional consideration is necessary, applicant believe that considering all claims is necessary for rigorous analysis, and that separate filing fees are an undue burden on applicant. This is not found persuasive because the examiner is given NO extra time for the additional consideration necessary to consider separate patentability requirements and features of the two separate groups. Also, applicant has provided no reasons or effective arguments to negate the validity of the different special technical features listed in the restriction.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Use of relative terms that lack clear metes and bounds in the claims, or definitive definitions in the original specification or cited relevant prior art, is vague and indefinite. In the last line of claim 1, see "improved". How is the bulk wetting properties of the article improved? Depending on whom one asks, or what the end-use and what the original unspecified degree of hydrophilicity was, either increasing or decreasing could be considered an "improvement". As presently written the claimed effect of the plasma will be considered to read on any result, which would cause any change in the degree of, hydrophilic.

In claim 3 "treatment" is not clearly related to any limitation(s) of the independent claim, so exactly what is intended to be continuous is not clearly defined.

For the record, silicon by its self is generally a solid material, but plasma are generally gaseous, so in claim 4, "the plasma comprises silicon" is considered to read on the plasma containing either Si vapor or a Si-containing gas or derivatives thereof.

In claim 5, it is unclear how the limitation "the ion sheath proximate the powered electrode" necessarily further limits the independent claim, as the capacitively-coupled system described would appear to be an in situ plasma, hence since the ion sheath is defined as being around at least one of the electrodes claimed, it may be considered to be "proximate" to all (both) of them, since proximate is a relative description of location that could fit either near or in (electrode near or in the ion sheath).

The Markush group of claim 6 is improper as the listed species are not mutually exclusive. For example, textiles or cloths may be either woven or non-woven; or the two species "woven materials" and "non-woven materials" between the two of them describe all materials in existence, hence between them overlap with all the other claimed species; and microporous may be a subset of foams.

Claims 7 and 8 are not related to any process step of independent claim 1. When is "a shadow mask" used? During the reaction of reactive species from the plasma with the article, or at some other time in the articles lifetime not directly related to the plasma?

In claim 14, "treatment" lacks antecedent basis, as there is NO limitation referring to a treatment in independent claim 1, so the relationship of the limitations of claim 14 to 1 is not clear. While the examiner presumes that the intent is to cause the plasma to attach the claimed species, this constitutes a guess on the part of the examiner, and is not a necessary limitation of claim 14.

While the term "diamond-like carbon" is considered to have a defined meaning in the art, the term used in claim 16, "diamond-like glass" when referring to a Si-containing film has no clear meaning. The term was found used on p. 12, lines 12-17 of the specification, but no definition of the scope or meaning of this term was found. Diamond is a specific Sp^3 crystalline form of carbon, and it is NOT made of Si. Glass is amorphous. It is unclear how Si-containing glass film can be defined in any way as diamond-like or what that might or necessarily mean with respect to the microstructure.

3. Claim 16 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. No clear enablement for determent what "diamond-like glass" is, or how to recognize a film with its properties, or what its properties are, was found in the specification. Also see end of section 2 above.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3, 5-7 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardella, Jr. et al. (4,946,903), in view of David et al (5,948,166).

Gardella, Jr. et al teach use of RF glow discharge plasma to modify porous fluoropolymer substrates to increase wettability and/or adhesiveness, by exposure in the glow discharge, to cause introduction of oxygen atoms, oxygen containing groups and hydrogen atoms, via covalent bonding to the original carbon polymer backbone. Uses include as membranes or filters, with mention of implantable prosthetics, and treating sheets of porous polymeric material exemplified. See the abstract; col. 1, lines 8-33; col. 2, lines 17-45; col. 3, lines 12-68^{+}; col. 4, lines 43-68; col. 5, lines 26- col. 6, line 6, plus table I; and Examples generally, specifically noting col. 6, lines 34-40 for RF plasma chamber, line 65 for sheet of porous PTFE, etc; and table II on Col. 9-10. Note that improved bulk wetting properties can be either an increase or a decrease in wetting depending on what is desired. Gardella, Jr. et al increase wettability. Also, the area of the glow discharge may be considered synonymous with the claimed ion sheath, hence by exposing their substrates to the glow discharge, the substrate are being located therein as claimed. Note Gardella et al "control" their input reagents to achieve desired results.

While Gardella, Jr. et al require use of RF glow discharge plasma, they do not provide any details of the apparatus used as claimed, however David et al teach an RF plasma apparatus taught to be useful for treating sheets of porous, temperature sensitive polymer material and for substrates used as orthopedic implants, packaging materials, etc. (abstract; figures; summary, esp. col. 4, lines 38-39, col. 11, lines 37-57; and col. 12, lines 10-25, esp. 13). David et al teach a

powered drum (cylindrical) shaped electrode, with sources and up-take spools supplying and collecting substrate and masking material, etc., to and from electrode, where the drum electrode creates the plasma around it. Idler rolls (32) employed by the apparatus may also be conductive and handle electrical current, and Faraday cages create grounded enclosures, which may be considered to read on the required grounded electrode (col. 8, lines 33-56). = While no discussion of the system being capacitively-couple was found therein, such would have been typical/expected of the described structure, and furthermore, in applicants' specification the paragraph bridging p. 7-8, states that their Fig. 2 (from which these claims take their support) with grounded chamber and rotating drum electrode is that described in this patent 5,948,166 to David et al, hence confirming this assertion. It would been obvious to one of ordinary skill in the art, to employ the apparatus of David et al in the process of Gardella et al, as it is suggested for use on the types of substrates being treated by the primary reference, with the advantage of solving deficiencies in both processing and alternative hollow cathode type plasma apparatus. Also, while David et al (166) only describes use of one powered drum electrode, use of a series of the taught configurations (with only one set of output and take-up spools) would have been obvious in view of Gardella et al's teaching that the plasma exposure may be "a single or series of... radio frequency discharges", which is suggestive of passing over a series of powered electrodes of the type taught by David et al, in order to achieve the taught treatment.

Treatment of only one, or of both sides of a sheet substrate, would depend on particular end use and the specific properties desired therefore, hence it would have been obvious for one of ordinary skill in the art to determine required extent of treatment considering particular end use requirements. Analogously, as only part of a surface may need to have increased

wettability/adhesiveness, use of mask for limiting treatment as suggested by David et al (masking web on spools 28E & 28F described on col. 7, line 58-col. 8, lines 6 and 57-67)

6. It is also noted that the David et al article "Plasma Deposition and etching of..." discussed on p. 7 of the specification, provides further teachings of capacitively coupled powered electrodes used for plasma treatments, where the type of apparatus is equivalent to the above rejection for those claims not requiring drum electrode(s).

7. Claims 1-7 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gsell, in view of David et al (166).

Gsell teach gas plasma treatment of porous media that may be made of synthetic fibers and various resinous materials in mats or web shapes. Treatment with various gases, such as Ar, N_2,...O_2, air, NH_3,...H_2..., or organosilane compounds, singly or in mixtures, improves the characteristics of the porous medium to enable separation and removal of fluids when used as a filter, etc. No specific plasma apparatus is discussed in detail, however radio frequency at low pressures with capacitive RF electrical discharge is one recommended, as are RF frequencies from about 1 KHz – about 100 MHz. See the abstract; col. 3, lines 42-col. 4, line 67, esp. 23-27 and 46-67; col. 5, lines 43-56^{+}; col. 6, lines 28-67 and examples.

Gsell lacks teachings of any specific electrode structure and ion sheath, with associated limitations therefore, but David et al (166) as discussed in section 5 above, provides for an RF plasma apparatus, suitable for treating substrates as taught in Gsell, hence for reasons analogous as stated above, use of David et al's apparatus for the process of Gsell would have been obvious due to the suggested use in David et al, and that the apparatus of David et al (166) fits the suggested capacitively coupled RF discharge reactor. Multiple treatments on like configuration,

i.e. multiple powered drums, is not patentably significant as it is a known mean of controlling length or timing of treatment.

8. Claims 1-7 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the PCT publication to Sayers (WO 99/05358), in view of David et al (166).

Sayers teach continuous plasma treating one or both sides of woven or non woven lengths of material for fabrics used in conveyor belts or filter cloths, etc. The plasma may render the surface hydrophobic or hydrophilic depending on need, where gases of O_2, air, NH_3, silanes and siloxanes, as well as dilutants, such as He, are among those suggested. It is stated that the treatment may use glow discharge dielectric barrier discharge plasma, but few details of the plasma apparatus are provided. See the abstract; Figure; p. 1, lines 5-9; p. 2, lines 13-18; p. 3, lines 9- page 4, line 13 and line 18- p.15, line 21. As few details of the plasma apparatus are provided, one of ordinary skill would have looked to prior art reference to find suitable apparatus to treat continuous running lengths as taught, and David et al (166) discussed above suggests fabric (col. 12, lines 10-25) are suitability treated by their means, with the advantages and benefits taught therein, hence would as reasoned above, have been obvious to employ in the process of the primary reference.

9. The EP publication to Rietzel et al (0 805 476 A2) is analogous to the primary references to Sayers or Gsell above for employing plasma with organosilicon, O_2 and inert gas mixtures to continuous webs, but does not discuss the original nature of the web.

10. Claims 14-15, and possibly 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sayers or Gsell, in view of David et al. as applied to claims 1-7 and 9-14 above, and further in view of Lee et al. (WO 00/16913).

While either Sayers or Gsell may make hydrophilic surfaces or plasma deposit a Si-containing film on their porous substrate, they do not teach O-containing plasma post treating. Lee (16913) discloses plasma treatment of porous webs treated to be hydrophilic and highly absorbent, where initial plasma treatment is a coating via plasma polymerization employing an organosilicon, O_2, and an inert gas, which may be followed by and O-containing plasma post-treatment to enhance the durability of the previously applied hydrophilic coating (lines 240-243; 268-282, 325-330). It is further noted that the process of Lee et al (16913) is very similar to the above combinations, as the requirement that on the RF driven electrode, low bias potential is achieved (p.7, lines 244-249) implies capacitive coupling, however the statement on p.5, lines 176-184, esp. 182, that each electrode receive equal amounts of RF energy, implies that there is no grounded electrode, but it may be referring to a plural powered electrode design. No figures are provided to clarify this issue, so Lee et al (16913) is not applied as a primary reference, but is substantially analogous to the above combinations. See the abstract, lines 10-16; 102-118; 176-249; 268-282; 288-298; 321-336^{+}; 366-379.

It would have been obvious to one of ordinary skill, to employ the materials, and sequence of Lee et al, in the process of Sayers or Gsell as combined with David et al, because the technique and objective are substantially similar, and Lee provides the advantage of enhanced durability. Note that claim 16 is tentatively included, as the steps to produce are the same as claimed, hence it inherently must be considered to be the same, especially lack any clear definition for what a diamond like glass Si-containing film may be.

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gardella, Jr. et al or Gsell or Sayers, in view of David et al (166) as applied to claims 1-7 and 9-14, as appropriate above, and further in view of Roller et al (5,980,814) or Ever hart et al (5,494,744).

None of these refers as discuss any "hydrophilicity gradients", although the concept of using a mask that in essentially a shadow mask is set forth in the above combinations. The patent to Roller et al discusses how the use of corona treatment (a type of plasma) on an apertured film, produces a wettability gradient between the treated and non-treated sides, (col. 9, lines 1-7 and 24-35 and col. 19, lines 57- col. 20, line 10), hence it would have been obvious to one of ordinary skill in the art that in any of the above combinations, when the option of treating one side is employed (with or without separate use of a mask), that a hydrophilicity gradient is in effect produced, weather or not it is discussed, especially as the claim requires no particular metes and bounds on the scope of the claimed gradient.

Alternately, Everhart et al expresses a need for "a pattern or gradient of surface modification on a relatively inert hydrophobic substrate", where fibrous or permeable web substrates are those being considered, as are various medical related enduses, consistent with those taught in the above references. Exemplary surface modification techniques to which this need may be applied include plasma and corona discharge treatments and slots to limit modification are contemplated (abstract; Fig. 1; col. 1, lines 8-21; col. 2, lines 1-21; col. 9, lines 40-65; col. 11, lines 45-67). It would have been obvious to one of ordinary skill in the art, given the taught need, that would apply equally to the products of the alternative primary references, and be applicable to their modes of surface modification, to effect the taught masking of David et al (166) to effect gradients as taught to be needed on such substrates as are to be modified, as

Everhart et al suggest the need for such an effect and its possibility of being achieved by masking is suggested by both Everhart et al and Davies teachings.

12. In the mass of out cited by applicant, it is noted that Brown et al (6,046,758) may be note worthy for its Si-DLC being related to what applicant might (or might not) mean by diamond-like glass.

The PCT to David et al (WO 01/66820 A1) is noted to have only 1 overlapping inventor with the present case, but its claim 9, is very similar, but not quite the same as applicant's 1+5+16.

13. Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/293,830. Although the conflicting claims are not identical, they are not patentably distinct from each other because the other application is a subset of the present claims, since fluorinating the article will inherently change its hydrophilicity. The present claim requirement that the change provide improved bulk wetting properties, is a relative term depends are whether one wants greater or lesser wetting to improve ones product.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on Monday-Friday from about 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Beck Shrive can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Padgett/LR
March 11, 2004
March 25, 2003

MARIANNE PADGETT
PRIMARY EXAMINER